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Impact of integration of clinical and outpatient units on cancer patient satisfaction

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Abstract

Objective. There is an ongoing drive to measure and improve quality of care. Donabedians' quality framework with structure, process and outcome domains provides a useful hold to examine quality of care. The aim of this study was to address the effect of an intervention in hospital structure (integration of three units into one) with the purpose of improving processes (increase meeting, cooperation and communication between professionals and patients) and its effect on the outcome (cancer patient satisfaction).

Design. Pre-test–post-test.

Setting. University Medical Center Utrecht, The Netherlands, Department of Medical Oncology.

Participants. Cancer patients ($n = 174$, $n = 97$).

Interventions. Physical integration by bringing separately located units (outpatient clinic, day-care clinic, clinical ward) together in one wing of the hospital and adjustments in communication and coordination structures.

Main Outcome Measure. Patient satisfaction questionnaire.

Results. Satisfaction with care improved for six scales (27%) after integration. Effect sizes (ESs) ranged from 0.36 to 0.80, indicating a small to moderate effect. The most important improvement was found at the day-care clinic on aspects like 'the degree in which the nurses were informed about a patients situation', 'privacy', 'interior design', 'quality of hospital equipment', 'sanitary supplies' and 'waiting periods'. With regard to continuity and coordination of care, satisfaction increased for five items (28% of items concerning continuity and coordination of care). ESs ranged from 0.42 to 0.75.

Conclusions. Integration of three oncology units into one unit had a positive impact on care delivery processes and resulted in improved patient satisfaction concerning care and treatment.

Keywords: quality of care, quality improvement, cancer care, patient-reported outcomes, patient satisfaction, structure, process

Introduction

As a result of the increasing competition in health care, there is currently an ongoing drive to improve the quality of care of health care organizations. The literature on quality of care in health care systems is increasing.

In 1990, a definition of quality of care was proposed by the Institute of Medicine (IOM) in the USA: 'Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge' [1]. In 2008, the WHO incorporated the patient perspective in their definition: 'Quality of care is the level of attainment of health systems' intrinsic goals for health improvement and responsiveness to legitimate expectations of the population [2].

A generally accepted and useful framework of structure, process and outcome for assessing quality of care was introduced by Donabedian in 1966 [3, 4]. He defined structure as the attributes of the setting in which care occurs and the resources needed for health care [5]. Processes of care denote the use of resources in terms of the actual delivery and receipt of care. Outcomes are consequences of health care. There are two principal domains of outcome: health status and user evaluation of quality of care (satisfaction) [6]. According to Donabedian, both structure and process aspects contribute to the outcomes, implicating that change of the structure or processes of health care delivery will have impact on the health related quality of life or patient assessed quality of care. Therefore, understanding how structure impacts processes and outcomes is an important condition for efforts to improve the quality of care [7, 8]. The relevance of this approach is supported by Brien *et al.* [9] who stated that in quality of care studies that address two or more of Donabedians structure, process and/or outcome criteria are the most insightful in locating problems in the provision of health care and subsequent quality improvement programs.

Because cancer is a disease that requires a large and complex care delivery system with numerous different professionals and often complex diagnostic and therapeutic programs, a considerable demand is placed upon quality of care for cancer patients. Traditionally, in the Netherlands care delivered by departments of medical oncology is organized in three separate units: an outpatient facility, a day-care (treatment) center and a clinical ward.

Generally, medical oncology patients will frequently visit all three units. From the perspective of the cancer patient, an integrated approach where patients will see the same health care professionals, regardless the unit they visit seems optimal [10–12]. Furthermore, the expectation is that integration will result in more timely and efficient care, aspects of health care which were highlighted by the IOM in their report Crossing the Quality Chasm [13].

With this in mind, the Department of Medical Oncology of the University Medical Center of Utrecht, the Netherlands was re-organized in 2007, integrating their three unit-based facility into one unit, with the aim of improving patient care. To determine the impact of this intervention on the patients' evaluation of quality of care, we performed a pre- and post-re-organization survey.

The aim of this study was to address the effect of integration of units with the purpose of improving the processes (to increase cooperation and communication amongst health care professionals and between healthcare providers and patients) and its effect on the outcome (satisfaction of patients with care).

Patients and methods

Design

A pre-test–post-test design [14] was used to assess patients' satisfaction with care, treatment and services provided. Data were collected before and after the physical integration of three units (clinical ward, day-care center and outpatient facility) of the Department of Medical Oncology of the University Medical Center Utrecht, The Netherlands, into one.

Questionnaire

The cancer patient care satisfaction questionnaire used in this study was based on a review of the literature and of existing questionnaires [15–20], focus group interviews with patients [11], the opinion of health care providers and a manual for the development of patient questionnaires [19]. Questionnaire items were arranged in scales based on their content by two of the authors (H.W. and M.H.) to reach content validity. A concept questionnaire was reviewed by a panel of experienced health care professionals of different disciplines, with the aim of evaluating the questionnaire on clarity, relevance, thoroughness and coherence. We also asked them which additional questions they wanted to ask the patients. The final questionnaire is a self-report questionnaire, containing 132 items to evaluate the competence and attitude of physicians and nurses, as well as aspects of organization of care and hospital environment.

Items were organized in 22 scales grouped in five categories: sociodemographic and medical information, outpatient clinic, day-care center, clinical ward and general questions concerning the department of Medical Oncology. In the categories outpatient clinic, day-care center and clinical ward, questions were asked concerning expertise, communication and attitude of doctors and nurses, patient education by doctors and nurses, expertise and attitude of secretaries, privacy, accommodation and organization. Questions concerning psychosocial support and counseling, food and beverages, research and some general questions, e.g. concerning attention for patient habits, lodging a complaint and attitude of supporting services, were added in the category 'General questions'. Patients had to complete only the questions concerning the unit(s) where they had been treated. Patients were invited to rate their satisfaction on a four point scale, ranging from 'Poor' (1), 'Reasonable' (2), 'Good' (3) to 'Excellent' (4).

This questionnaire was used before and after the re-organization. After re-organization the questionnaire was extended with four single items concerning the new department ['Privacy at the counter' (clinical ward), 'Helpfulness of volunteers' (clinical ward), 'Integration of the clinical ward, day-care center and outpatient clinic' (general) and 'Coordination between the units' (general)].

Patients

In 2005 and 2007, patients treated in the department of Medical Oncology, University Medical Center Utrecht, were approached to participate in this study. During a period of 6 weeks doctors and nurses handed out the questionnaires to an unselected sample of consecutive cancer patients at the outpatient clinic, the day-care clinic and the inpatient clinic. Names and addresses of all patients to whom a questionnaire was handed out, were registered. Patients were excluded if

they could not understand the Dutch language or if their physical condition prohibited them to complete the questionnaire. Patients received an envelope with the questionnaire and a cover letter to inform them about the aim of the study and the importance of their participation. An instruction for completing the questionnaire was included. A phone number and email-address to contact the investigator were provided. Respondents could complete the questionnaire at home and return it anonymously in a self addressed pre-stamped envelope. After checking their current health care status, a reminder was send after 3 weeks to each patient who received a questionnaire.

Intervention (physical integration of units and re-assessment of procedures)

The intervention consisted of a physical integration by bringing the separately located units (outpatient clinic, day-care center and clinical ward) together in one wing of the University Medical Center Utrecht and adaptations in care processes. The outpatient clinic is used for follow-up visits and decision-making concerning treatment. The day-care center is used for short courses of chemotherapy and interventions such as blood transfusions, paracenteses and fluid administrations; whereas the clinical ward is used to administer complex chemotherapy and to provide intensive palliative and terminal care for cancer patients. The medical oncology department yearly has over 600 new patients, 800 admissions at the clinical ward, 1600 administrations of chemotherapy and 1000 other interventions at the day-care clinic. There have been no significant changes in patient volume and number of beds (18) in the ward and the day-care clinic during the study period.

The integration (and renovation) took place between January and October 2006. The results of the pre-test questionnaire were assessed by all health care professionals involved (i.e. medical oncologists, nurses, secretaries, managers) and used for the re-organization.

The results of focus group interviews with patients obtained in an unbiased manner and without interference by health care professionals were also used for the re-organization. The results of these interviews have been described elsewhere [11]. Briefly, we asked patients in a standardized and unrestricted way how they would design health care, without primarily paying attention to the feasibility of their wishes and without the influence of health care workers. The latter study was included to maximize patients' input in the improvements made.

By bringing the separately located units together in one wing, the distances between the units was physically brought back to zero where before it took 5 min to walk between the day-care center/outpatient clinic and the clinical ward. The new department was arranged and decorated on the basis of needs and preferences concerning the environment expressed by patients [11]. On the basis of patient wishes, adaptations were made in the lighting of the patient rooms and the unit, the design and accessibility of the sanitary unit, a more colorful decoration of rooms, arrangement of beds at the day-care clinic and more comfortable chairs and beds. Furthermore in the new situation there are mainly single and double rooms, better possibilities for privacy during hospital stay either with or without visitors and in the waiting room of the outpatient clinic.

Since the integration of units oncology nurses work in so-called core teams. These teams include nurses with specific expertise concerning either the outpatient clinic, the day-care clinic or the ward. The teams are supported by oncology nurses that rotate through the various entities. Furthermore, there is a structural 'briefing' (exchange of information between care givers) between doctor and nurse before visiting patients, so that both parties are always well-informed of the patients' current situation. Furthermore, models for nursing assessment and reporting differed between the units and are now geared to each other. This improved the coherence between the teams and the efficiency in finding patient related information.

Finally, since the integration there is more uniformity in technical actions. Technical operations (e.g. blood transfusions) are now carried out in a more standardized way and with the same resources within the different units.

Data analysis

Data were analyzed using SPSS version 15.0 (SPSS Inc., Chicago, IL, USA). The reliability of the scales of the questionnaire was examined by analyzing the internal consistency coefficient (Cronbach's alpha) and the mean inter-item correlation coefficient (MICC) for each scale. Cronbach's alpha coefficient was considered sufficient if ≥ 0.70 [21] and MICC-values should fall in the range of 0.15–0.50 [22].

Scale scores were transformed to a scale range of 0–100, with high scores indicating high levels of satisfaction. Mean scores and standard deviations for both groups were calculated.

Mean scores of pre- and post-test were compared using Mann–Whitney tests. In case of significant differences ($P < 0.05$) between groups, effect sizes (ESs) were calculated to estimate the magnitude of these differences. According to Cohen's thresholds [23], an ES of <0.20 indicates a trivial effect, an ES of ≥ 0.20 to <0.50 a small effect, an ES of ≥ 0.50 to <0.80 a moderate effect and an ES of ≥ 0.80 a large effect. An ES ≥ 0.20 reflects a relevant difference between groups [24].

In the post-test, we asked patients a question concerning 'coordination between units'. This question was not asked in the pre-test and therefore we could not compare results of pre- and post-test on this particular point. To get insight into satisfaction concerning continuity and coordination of care we selected those items (18 items out of all items) which were related specifically to this subject. On item level results of pre- and post-test were compared (only for these items) by using Mann–Whitney tests.

Results

Patients

In September and October 2005, questionnaires were handed out to 243 patients. In total, 174 (72%) questionnaires were

Table I Characteristics of respondents

Characteristic	Patients completing the questionnaire in 2005 ($n = 174$)	Patients completing the questionnaire in 2007 ($n = 97$)
Gender, *n* (%)		
Male	114 (66)[a]	50 (52)[a]
Female	59 (34)	46 (48)
Age, years, *n* (%)		
<20 years	1 (1)[a]	–[a]
20–39 years	20 (12)	18 (19)
40–59 years	55 (32)	34 (35)
60–79 years	93 (54)	40 (42)
>80 years	4 (2)	4 (4)
Level of education, *n* (%)		
Less than high school	39 (23)[a]	23 (24)
High school	72 (42)	44 (45)
More than high school	61 (36)	30 (31)
Period since start treatment at the department of Medical Oncology, *n* (%)		
<3 months	14 (8)[a]	3 (3)
3–6 months	18 (11)	11 (11)
6–12 months	27 (16)	31 (32)
1–2 years	41 (24)	14 (14)
>2 years	69 (41)	38 (39)

[a]Some missing value.

returned. Of the respondents, 99% visited the outpatient clinic, 74% the day-care center and 53% the clinical ward.

Between September and November 2007 (after the re-organization), questionnaires were handed out to 125 patients. In total, 97 (78%) questionnaires were returned. Of the respondents, 99% visited the outpatient clinic, 51% the day-care centre and 47% the clinical ward.

Patient characteristics are summarized in Table 1. There were slightly more males and more elderly patients in the pre-test sample.

Reliability of the questionnaire

The internal consistency was sufficient for most scales. In the pre-test questionnaire Cronbachs alpha was >0.70 for all but two scales ('Privacy at the outpatient clinic' and 'Privacy at the day-care center'). In the post-test questionnaire only one scale had a Cronbachs' alpha value of <0.70 ('Privacy at the outpatient clinic'). As the MICC was satisfactory for these scales, we decided to keep the scales in the questionnaire.

Comparison satisfaction scores pre- and post-test

Table 2 shows the mean scores of the scales and the single items. Both in the pre- and post-test analysis patients were satisfied with the quality of care, treatment and services they received, with all mean scores >60. For all scales and single items, there was a wide range of scores, with minimum values varying from 0 to 33 and maximum values of 100 for every scale and single item.

There were statistically significant and relevant increases of satisfaction with care in the post-test analysis for six scales ('Accommodation at the outpatient clinic', 'Nurses at the day-care clinic', 'Privacy at the day-care clinic', 'Accommodation at the day-care clinic', 'Organization at the day-care clinic' and 'General aspects concerning the department of Medical Oncology'). ESs ranged from 0.36 to 0.80. A large effect (ES 0.80) was found for 'Accommodation at the outpatient clinic'. The most important progress in satisfaction was found at the day-care clinic. Judging the separate items in these scales, most of the progress had been achieved on aspects like the degree in which the nurses continuously were completely informed about a patient's situation, privacy, interior design of the day-care clinic, quality of the units equipment, sanitary supplies and waiting periods.

Continuity and coordination of care

To get a better insight into satisfaction concerning continuity and coordination of care we selected 18 items out of 3 categories (outpatient clinic, day-care center, clinical ward) related specifically to this topic and compared the results of 2005 and 2007. Table 3 shows the mean scores of these items. There were statistically significant and clinically relevant increases for five items. ESs ranged from 0.42 to 0.75, indicating a small to moderate effect. Most of the improvements (four out of five) were seen at the day-care clinic.

In the post-test questionnaire the patients indicated a high level of satisfaction with coordination between units (single item mean score 80).

Discussion

The aim of this study was to analyze the effect of a change of hospital structure (physical integration of outpatient clinic, day-care facility and clinical ward, into one unit), with the purpose of improving the process of care (to increase cooperation and communication between professionals mutual and among healthcare providers and patients) and its effect on the outcome (satisfaction of patients with care and treatment). Our study showed that patient satisfaction with care increased significantly on six scales by bringing the separately located medical oncology units together in one wing of the University Medical Center. Improvements were mainly seen at the day-care clinic and were related both to accommodation and the processes of care (e.g. waiting periods, communication and information).

Improvements of the processes of care were probably at least partly the result of the proximity of the three units after the re-organization. Before the physical integration, there was not only a geographical separation, but also separation of the nursing and medical teams. Since the integration health care professionals of the different teams are more visible to each

Table 2 Patient satisfaction before and after integration

	Number of items	2005 Mean (SD)	2007 Mean (SD)	*P*-value	ES
Satisfaction at outpatient clinic with		($n = 173$)	($n = 96$)		
Physicians	9	87 (15)[a]	86 (14)	0.80	–[b]
Patient education by physicians	10	79 (17)	80 (14)	0.68	–
Secretaries	4	86 (16)	83 (17)	0.17	–
Privacy	3	75 (15)	76 (14)	0.70	–
Accommodation	5	60 (17)	73 (15)	0.000	0.80
Organization	6	75 (16)	75 (15)	0.76	–
Mean score for this category		77 (12)	79 (11)	0.27	
Satisfaction at day-care clinic with		($n = 129$)	($n = 49$)		
Nurses	8	77 (15)	85 (16)	0.001	0.52
Patient education by nurses	8	71 (19)	78 (15)	0.056	–
Privacy	3	64 (18)	73 (21)	0.006	0.47
Accommodation	6	64 (15)	75 (15)	0.000	0.72
Organization	5	68 (15)	78 (15)	0.001	0.67
Mean score for this category		69 (13)	79 (13)	0.000	0.77
Satisfaction at inpatient clinic with		($n = 92$)	($n = 26$)		
Physicians	7	76 (18)	79 (17)	0.46	–
Patient education by physicians	8	74 (18)	72 (17)	0.63	–
Nurses	8	79 (15)	80 (14)	0.99	–
Patient education by nurses	9	72 (17)	71 (16)	0.68	–
Privacy	3	73 (20)	70 (16)	0.27	–
Accommodation	7	67 (18)	74 (13)	0.075	–
Organization	7	72 (16)	73 (14)	0.79	–
Mean score for this category		74 (12)	74 (12)	0.78	
Satisfaction at Department of Medical Oncology (general) with		($n = 122$)	($n = 80$)		
Psychosocial support	5	66 (22)	69 (20)	0.11	–
Food and beverages	5	66 (21)	63 (18)	0.26	–
Clinical Research	2	66 (23)	67 (23)	0.91	–
General items	5	66 (24)	74 (18)	0.009	0.36
Single items					
Privacy at the counter (inpatient clinic) ($n = 96$)			68 (17)		
Helpfulness of volunteers (inpatient clinic) ($n = 80$)			81 (18)		
Integrations of inpatient clinic, day-care clinic and outpatient clinic (general) ($n = 66$)			86 (18)		
Coordination between the units ($n = 64$)			80 (18)		

[a]A higher score indicates a higher level of satisfaction (range 0–100).
[b]–, not statistically significant.

other and spend coffee and lunch breaks together. Moreover, nurses rotate between teams and at the outpatient clinic, doctors and nurses of the day-care center meet and discuss the patients prior to their visits to the clinic. As a consequence, there is an improvement of communication, coordination and continuity of care. Furthermore the patient will see familiar faces regardless of where they are treated. Formerly, in case of admission to the hospital, patients came to an entirely new part of the hospital with new employees. In the current situation, the patient remains in the same part of the hospital with familiar health care providers.

Because there are no boundaries anymore between the units, nurses and doctors of the day-care clinic and the outpatient clinic have a better opportunity to visit a patient when he/she is hospitalized and vice versa and show their involvement in that way. All these changes contribute to a better interaction between health care providers and patients and to an improvement of continuity in care and treatment.

Data showed that greatest increment in satisfaction was shown at the day-care clinic. The question is why especially the day-care clinic profited from these changes in structure and process. A possible explanation is that in the old situation this unit was most separate, was old fashioned and patients were treated in one and the same space with limited or no privacy. Moreover, the day-care clinic has a small and therefore a more vulnerable team. In the new situation they have the most benefit of flexible availability of nurses and separate adjacent rooms, offering more opportunity for

Table 3 Items concerning coordination and continuity before and after integration

Item	2005 Mean (SD) ($n = 174$)	2007 mean (SD) ($n = 97$)	*P*-value	ES
Satisfaction at outpatient clinic with	($n = 173$)	($n = 96$)		
Degree to which the doctor is (continuously) completely informed about the patients' situation	86[a] (18)	84 (19)	0.40	–[b]
Uniformity of the information provided by the different doctors	72 (23)	72 (20)	0.93	–
Communication/continuity between different disciplines	72 (20)	74 (20)	0.39	–
Degree of treatment by the same doctor	84 (20)	82 (21)	0.65	–
Satisfaction at day-care clinic with	($n = 129$)	($n = 49$)		
Degree to which the nurses are (continuously) completely informed about the patients' situation	70 (20)	85 (20)	0.000	0.75
Uniformity of the information provided by the different nurses	69 (20)	77 (17)	0.031	0.42
Communication between the nurses	70 (17)	82 (17)	0.000	0.71
Communication/continuity between different disciplines	69 (18)	77 (17)	0.006	0.45
Communication between day-care clinic and inpatient clinic	72 (18)	78 (16)	0.10	–
Satisfaction at inpatient clinic with	($n = 92$)	($n = 26$)		
Degree to which the doctor is (continuously) completely informed about the patients' situation	77 (22)	78 (19)	0.89	–
Uniformity of the information provided by the different doctors	74 (22)	71 (21)	0.62	–
Degree to which the nurses are (continuously) completely informed about the patients' situation	74 (21)	78 (16)	0.59	–
Uniformity of the information provided by the different nurses	70 (18)	71 (21)	0.99	–
Degree of treatment by the same doctor	73 (20)	74 (20)	0.85	–
Communication between the nurses	73 (17)	78 (16)	0.22	–
Communication/continuity between different disciplines	69 (22)	74 (17)	0.47	–
Communication between day-care clinic and inpatient clinic	74 (14)	79 (17)	0.25	–
Communication with the general practitioner and home care	63 (27)	78 (16)	0.027	0.63

[a]A higher score indicates a higher level of satisfaction (range 0–100).
[b]–, not statistically significant.

privacy. The day-care clinic now remains open up to the evening hours, and if necessary clinical patient rooms can be used for day treatment. Satisfaction at the day-care clinic is now more equal to satisfaction at the outpatient clinic and the inpatient clinic.

Considering the satisfaction scores of the post-test in the light of our earlier research in which we studied cancer patients' preferences with regard to health care [11], this study showed that the department of Medical Oncology scored well on aspects of care to which patients attach most value, namely expertise, performance and attitude of physicians and nurses. Satisfaction scores with doctors and nurses at the outpatient and day-care clinic were above 85. The lowest score (63) was found for 'food and beverages' at the department of Medical Oncology. In the patients' preferences study [11] 'food and beverages' was categorized in the relatively less important aspects of care. In spite of that, it is important that careful attention is given to the quality of the meals in hospitals.

A potential limitation of the study is that we did not explicitly ask the question concerning 'coordination and continuity between units' in the pre-test. Therefore, pre- and post-test comparison of this important item was not possible. We have solved this limitation by selecting and comparing items concerning this subject. This comparison showed that there was a significant progress in coordination between units and health care professionals. The degree to which the physician and nurses were continuously completely informed about the patients' situation, the sameness of physicians at the outpatient clinic and coordination between nurses at the day-care clinic all had mean scores over 80 in the post-test. However, there still is room for improvement. The issue of uniformity of information by doctors and nurses needs extra attention in the future.

Other potential limitations of the study were the impossibility to ask the same patients to participate in the pre- and post-test analysis and the (unexplained) lower number of patients in the post-intervention period. Furthermore the improved responses might reflect to a limited extent a 'halo-effect' from providing a nice, new facility, rather than the other aspects of the new design. However, our earlier research [11] into cancer patients' health care preferences showed that environmental aspects scored among the relatively less important care aspects. Furthermore at the moment of the post-test the new department was already in use for a year and therefore no longer brand-new. As patients are usually treated for a limited period in our department it is unlikely that patients participating in the post-test knew the

old situation. So we therefore think that the impact of this aspect upon the overall appraisal of care is limited.

In conclusion, this study confirmed that an intervention in structure has impact on processes and outcome of care. Integration of three units into one resulted in an increased patient satisfaction on several aspects concerning care and treatment at the department of Medical Oncology of the UMC Utrecht Cancer Center. Care processes have been restructured finding synergies and new forms of cooperation. Departments that provide cancer care may benefit from a periodical structured evaluation of patient satisfaction and care processes with subsequent implementation and evaluation of changes.

Future research should focus on the impact of this (kind of) intervention on the satisfaction of staff.

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